REMARKS

I. Introduction

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

II. The Rejection Of Claims 1, 3, 19, 20, 22 And 24 Under 35 U.S.C. § 102/103

Claims 1, 19, 20, 22 and 24 were rejected under 35 U.S.C. § 102(e) as being anticipated by or, alternatively, under 35 U.S.C. § 103(a) as being unpatentable over Qiu et al. (Thin Solid Films, Vol. 372, (2000) pp 265-270); claims 1, 3, 19, 20, 22 and 24 as being anticipated by or, alternatively, under 35 U.S.C. § 103(a) as being unpatentable over Higashi (EP 1063869); claims 1, 3, 19, 20, 22 and 24 as being anticipated by or, alternatively, under 35 U.S.C. § 103(a) as being unpatentable over Matsuo et al. (EP 1231252); and claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Qiu et al. Applicants respectfully traverse these rejections of the pending claims for at least the following reasons.

With regard to the present disclosure, amended independent claims 1 and 20 each recite an organic electroluminescent device comprising an organic compound layer including at least one hole transport film containing NPB (N,N'-di(naphthalene-1-yl)-N,N'-diphenyl-benzidine), wherein said organic compound layer contains copper atoms as impurities in a weight concentration of from 40 to 200 ppm. Similarly, claim 22 recites a concentration of copper atoms as impurities of under 200 ppm. As a result of these features, an organic electroluminescent device having great industrial value may be obtained.

The Examiner alleges that because Qiu and Matsuo teach the same method of synthesis of the organic compound layer, the compounds obtained in Qiu and Matsuo inherently have the same characteristics.

Applicants have previously demonstrated that this argument is invalid. In several previous responses, Applicants showed in Table 1 of the specification, the copper impurity level may be as high as 1500 ppm or greater. For an object or material to have an inherent property, it ***must*** have said property, otherwise, it is not inherent. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). As Table 1 clearly demonstrates compounds formed by the method of the present disclosure have a vast range of concentrations, it is very apparent the claimed range of 40-200 ppm is not inherent.

The Examiner also suggests it would have been obvious to purify the organic compounds of Qiu, Higashi and Matsuo to obtain the copper impurity range of claims 1, 20 and 22. However, only result effective variables can be optimized, and to assert obviousness the optimized variable must be recognized by the ***prior art***. See MPEP § 2144.05. In the instant case, the prior art has not shown that the impurity level of copper is a result-effective variable, so the Examiner can not rely on the theory that it would have been obvious to purify the claimed phenylamino compound to within the claimed concentration range.

As taught in MPEP § 2144.05(II)(B) under the heading "Only Result-Effective Variables Can Be Optimized":

> A particular parameter must first ***be recognized*** as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. (citing *In re Antonie*, 195 USPQ 6 (CCPA 1977)) (emphasis added).

In the instant case, the cited prior art is silent regarding Cu concentrations of not lower than 40 ppm and/or not higher than 200 ppm as achieving a recognized result; so there is no basis for alleging obviousness thereof based on process optimization. Accordingly, the claimed

features would not have been obvious in view of Qiu, Higashi, or Matsuo because the cited prior art does not recognize the claimed parameters as achieving a recognized result.

Moreover, when impurities are removed by a sublimation purification method or the like, the yield of target material is decreased. Thus, if an industrial process of removing impurities is repeated in order to decrease the content rate of the impurities, it will result in far more problems, (i.e., lower yield, more cost and time for purification). As a result, a careful balance between the purity of the compound and the cost of producing said compound is desired. This is reflected in the claimed copper impurity concentration of the present disclosure. Thus, the Applicants have shown that the concentration of copper is not inherent in the cited prior art. As such, the cited prior art are non-enabling references.

Furthermore, the features of the present disclosure recited in claims 1, 20, and 22 provide **unexpected superior results** in relation to improved luminous efficiency and luminescent lifetime. It is alleged that the results are not unexpected, but rather, that as purity goes up, luminescent lifetime goes up. However, nowhere in the cited prior art is there any indication of the rapid and significant jump in luminescent lifetime when going from 800 to 200 ppm. Whereas lowering of copper impurity from 1500 to 800 ppm (a 700 ppm drop) only increased the lifetime from 130 to 170 hours, **further lowering the impurity another 600 ppm (from 800 to 200 ppm) increases the lifetime from 170 to 400 hours!!!** Thus, outside the claimed range, a 700 ppm decrease results in 40 hr increase. However, a 600 ppm decrease into the claimed range results in a 230 hour increase in lifetime. This is a nearly 700% jump in the rate of lifetime increase/ppm decrease. The unexpected jump in luminescence lifetime when going from 800 ppm to 200 ppm **cannot** be predicted by the prior art. As such, it is unclear how the

Examiner can continue to hold that this is not unexpected or significant upon review of such data.

The Examiner again contends the "applicant has not provided clear evidence that the compounds of the prior art do not have the required copper atom impurity levels." However, it is not the burden of the Applicants to provide this evidence. It is the burden of the Examiner to provide clear evidence that the prior art teaches the claimed impurity levels. The Examiner has admittedly failed to do so, and has improperly relied upon inherency arguments that the Applicants have shown to be wrong. Accordingly, in view of the above, it is clear that none of the cited prior art teach all of the limitations of claims 1, 20 and 22 of the present disclosure.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Moreover, in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. Because Qiu, Higashi, and Matsuo do not disclose the organic compound layer contains copper atoms as impurities in a weight concentration of not lower than 40 ppm and not higher than 200 ppm, as required by claims 1 and 20; and the copper atoms can be detected, and are present in a weight concentration of not higher than 200 ppm, as required by claim 22, Qiu, Higashi, and Matsuo do not anticipate, or render obvious, claims 1, 20, and 22.

III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 1, 20 and 22 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance. As such, Applicant respectfully submits that the new claims 6-11 are allowable over the cited prior art.

IV. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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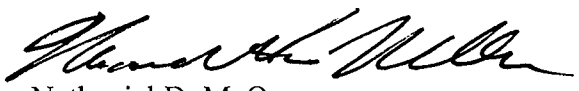

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